P. icarus.—Common in all localities.

P. amandus.—Kalavryta, near Korce and Monastir.

P. hylas.—A pass near Korce, very worn also at Monastir.

P. escheri.—I took two forms of this insect, one near Sebenik and the other at Kalavryta, where it was very common on lower slopes of Chelmos.

P. thetis (*bellargus*).—Sebenik, Korce and Monastir, common.

P. semiargus.—Common near Monastir and on pass near Korce.

Iolana iolas.—One seen near Cettinje.

Glaucopsyche (*helena*) *melanops.*—Occurred in small numbers a few still fresh at 4500 feet on Chelmos second week in June.

G. cyllarus.—A few worn in Dalmatia.

Lycaenopsis argiolus.—Kalavryta only.

Lampides baeticus f. *orientalis.*—One specimen quite fresh near Sebenik.

Spilothyrus altheae.—Korce and near Monastir.

Powellia orbifer.—Widely distributed and common at Kalavryta.

Hesperia serratulae var. *balcanica.*—Near Sebenik and Cettinje, Monastir common.

H. armoricana.—Sebenik, Cettinje, Kalavryta and Korce.

H. malvoides.—Sebenik and near Monastir.

H. phlomidis.—I took a fine series of this insect just out, on the hills between lakes Malik and Ochrida on June 22nd. The insect was flying over the limestone outcrops in the clearings among the oak scrub. It was easy to catch if flushed, when the weather was cloudy. But as soon as the sun became hot it became very active and almost impossible to follow. I took 17 males and six females.

H. sidae.—Only seen near Monastir, June 24th, when it was locally common and fresh.

Nisoniades tages.—A few at Sebenik and Monastir. Common on Mt. Chelmos at 6000 feet.

Gegenes nostrodamus.—We took four specimens of this insect on May 29th, two or three miles north of the Val d'Ombla near Ragusa. One was fresh and three were worn. Evidently we were too late for the first brood.

Thymelicus acteon.—One specimen at Cettinje on May 30th.

Adopaea flava (*thaumas*).—Kalavryta and Patras, common.

Augiades sylvanus.—Locally common in Albania, one taken at Megaspelion.

One hundred and three species.

Notes on Heliothis peltigera, Schiff.

By H. B. D. KETTLEWELL.

I have been prompted by Dr. Cockayne's most interesting article under this heading (page 161, Vol. XLII.) to write my own observations on the forced pupae of this species in the autumn of 1928. This stimulus to write these notes has been further increased by the fact that my results are entirely different not only from Dr. Cockayne's but also from everybody else, who had the good fortune to breed this species in this year.

Briefly his results were these, that pupae forced in the autumn of 1928 from larvae obtained a month or so earlier produced "light"

	Forced or Unforced	Colour.	Numbers.	Duration of Pupal Period.	Temperature During		Humidity.
					Resting Period.	Forcing Period	
Dr. Cockayne Lot 1	Forced	Light	16	Oct. 2—Oct. 27. 25 Days	Constantly cool	Very hot	Very dry
Dr. Cockayne Lot 2	Forced	Light	16	Oct. 10—Nov. 10-17. 33 Days (average)	Constantly cool	Very hot	Very dry
Dr. Cockayne Lot 3	Forced	Light	16	Oct. 10—Nov. 24. 48 Days. Dec. 2 (average)	Constantly cool	Very hot	Very dry
Mr. Worsley Wood	Forced	Light	70	Sept. 20—Dec. 2. 70 Days (average)	Constantly cool	hot	Very dry
Mr. H. B. Williams	Forced	Light	?	?	Constantly warm	hot	Very dry
H. B. D. Kettlewell	*Forced*	Dark	16	Sept. 20—Oct. 20. 43 Days	Varying day and night temperatures	Very hot	*Saturated*
Dr. Cockayne	Unforced	Dark	23	Oct. (1928)—Sept. (1929). 300 Days (average)	Very cold Very hot	Hot (heat wave)	Dry
Mr. H. B. Williams	Unforced	Dark	9	"Three weeks to a month." 24 Days	Constantly warm	?	In damp fibre

examples which are absolutely and entirely different from the "dark," "tawny olive" and "wood brown" forms he obtained from 1929 unforced pupae. He does not pretend that there are not intermediate forms, but taken as a whole the difference between these two forms was most striking and for the most part the results uniform.

I will now recall the fact that pupae forced by me in the autumn of 1928 from larvae taken at Dungeness at the end of August, all produced "dark" forms of *H. peltigera*. There can be no dispute regards the actual forcing, the heat was terrific. Thinking there must be some mistake on my part I wrote to Dr. Cockayne and after a lengthy correspondence in terms of Ridgway Colours in which I was severely handicapped, not having a Ridgway Card, I eventually sent him my series of fifteen *peltigera*.

In his reply he says, "Your forced ones match my 1929 unforced ones almost exactly both in tint and depth of colour." What is the factor at work that caused mine to favour this dark form while the majority of breeders obtained extremely pale forms? Be it what it may it leaves Dr. Cockayne's concluding remark open to challenge, "I have therefore very little doubt that the light ground and reduced markings were the direct result of heat applied to the pupae, and since the two very dark ones developed during the coldest period of 1929 I have very little doubt that their dark colour was the result of cold applied to the pupae." I will therefore tabulate a list of the varying conditions imposed on the pupae by various breeders who have been good enough to give me their full data:—

From the above table of time, temperature, etc., it can be seen that my treatment differed from that of my friends in two points only. Firstly my pupae were subject to outside day and night temperatures until they were dug up in late September, and as they were then in Devon they experienced no very cold night temperatures so I think that a "cold" factor can be eliminated.

There only remains the question of the actual forcing conditions. All my friends forced their pupae on mantle-pieces over fires and the air must have been absolutely dry. Mine were forced in "The Tropical-Pit" of the Cambridge Gardens. The temperature was extremely high and the air absolutely saturated with moisture.

Furthermore the tin containing these pupae was placed on an inverted flowerpot and stood in the middle of a water tank so as to avoid the attention of the host of ants which swarmed here.

It therefore seems to me reasonable to accept Mr. Williams' explanation of my dark coloured forced ones.

"The essential difference is that your forcing was in 'damp' heat ours in 'dry' heat." And he goes on to add that he has previously obtained different results in the use of "dry" and "wet" forms of heat in other species.

The common factor then in the production of examples . . . on the one hand my 1928 forced examples, and on the other Dr. Cockayne's 1929 unforced ones, . . . is that in neither case did they undergo a process of "drying up." In my case artificial heat and watervapour were produced, in his, normal temperatures and humidity were experienced.

Although this is a negative factor I believe this is all important in the production of dark *peltigera*.